

# **Network for Earthquake Engineering Simulation (NEES): System Integration**

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***Program Solicitation***  
**NSF 00-7**

**DIRECTORATE FOR ENGINEERING**

**DEADLINE DATE:** *March 21, 2000, 5:00 PM (submitter's local time)*



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## SUMMARY OF PROGRAM REQUIREMENTS

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### GENERAL INFORMATION

**Program Name:** Network for Earthquake Engineering Simulation (NEES): System Integration

**Short Description/Synopsis of Program:** The goal of the Network for Earthquake Engineering Simulation (NEES) Program is to provide a networked, national resource of geographically-distributed, shared-use next generation experimental research equipment installations, with teleobservation and teleoperation capabilities, which will shift the emphasis of earthquake engineering research *from* current reliance on physical testing *to* integrated experimentation, computation, theory, databases, and model-based simulation. NEES will be a collaboratory, i.e., an integrated experimental, computational, communications, and curated repository system, developed to support collaboration in earthquake engineering research and education. Through NEES, the earthquake engineering community will be catalyzed to utilize its advanced experimental capabilities to test and validate more complex and comprehensive analytical and computer numerical models that will improve the seismic design and performance of our Nation's civil and mechanical systems. NSF plans that the NEES collaboratory will be developed by September 30, 2004, and will be operational through September 30, 2014.

The NEES Program will be developed through a series of solicitations. This solicitation, NSF 00-7, "NEES: System Integration," requests proposals to develop the high performance system that will enable the NEES collaboratory for the earthquake engineering research community. The NEES collaboratory will provide end-to-end connectivity supporting two interconnected subsystems: 1) an operating subsystem that provides access to and teleobservation and teleoperation capabilities of NEES experimental research equipment and a curated repository of experimental data, user-developed simulation software, and models; and 2) a computational subsystem that enables computation and distributed simulation for earthquake engineering research. NSF will use a two-step process to select one System Integration award. First, as a precursor to the System Integration award, NSF intends to fund up to three awards for six-month scoping studies. Second, depending on the quality of the scoping study reports and the original proposal, NSF intends to select one System Integration award from among one of the scoping study awardees. Proposals submitted to this solicitation will therefore contain two proposals in the project description: the full system integration proposal and the scoping study proposal.

**Cognizant Program Officer:** Dr. Joy Pauschke, NEES Program Director, telephone (703) 306-1380, fax (703) 306-0290, e-mail: nees@nsf.gov. To ensure that all proposers receive the same information, all questions concerning this solicitation, except for those related to FastLane, will only be accepted by e-mail. Please e-mail questions to nees@nsf.gov and include in the heading "SYSTEM INTEGRATION SOLICITATION." All questions, except for those related to FastLane, must be received

at NSF on or before February 11, 2000, so that NSF can post the responses of interest to all proposers before the proposal deadline on the NSF NEES FAQ web page at: <<http://www.eng.nsf.gov/nees>>.

**Applicable Catalog of Federal Domestic Assistance (CFDA) No.: 47.041 - Engineering Grants**

## **ELIGIBILITY**

- ♦ **Limitations on the categories of organizations that are eligible to submit proposals:** Proposals may be submitted by U.S. universities and colleges; U.S. non-profit, non-academic organizations; and U.S. for-profit organizations. Collaborative proposals involving more than one organization must be submitted as a single administrative package from the organization where the principal investigator is a full-time employee.
- ♦ **Principal investigator eligibility limitations:** The principal investigator must be a full-time employee of the organization submitting the proposal. The principal investigator and co-principal investigator(s) may not be principal investigator or co-principal investigator for proposals submitted to the companion solicitation, NSF 00-6, "NEES: Earthquake Engineering Research Equipment." NSF expects continuity in key personnel from the scoping study award to the full system integration award, in the event that a System Integration award is made.
- ♦ **Limitations on the number of proposals that may be submitted by an organization:** None

## **AWARD INFORMATION**

NSF will use a two-step merit review process to make one award for NEES System Integration. First, NSF intends to fund up to three scoping study awards, of up to \$300,000 each. The scoping study awards will have a six-month duration and each awardee will produce a scoping study report to NSF. Second, NSF intends to fund one System Integration award, of up to \$10,000,000, to be selected from among one of the scoping study awardees, based on merit review of the scoping study reports and merit review of the original proposals submitted by the scoping study awardees. The scoping study and System Integration awards will be cooperative agreements. Proposals may be submitted for a total amount of up to \$10,300,000 (which includes up to \$300,000 for the scoping study proposal and up to \$10,000,000 for the full system integration proposal). The System Integration awardee will develop and operate the NEES System through September 30, 2004.

### **Scoping Study Awards**

- ♦ **Type of award anticipated:** Cooperative Agreement
- ♦ **Number of awards anticipated in FY 2000:** Up to three
- ♦ **Amount of funds available:** Approximately \$900,000 will be available for scoping study awards in FY 2000, pending availability of funds; up to \$300,000 per scoping study award.
- ♦ **Anticipated date of awards:** June 2000
- ♦ **Award duration:** Fourteen months (June 2000-July 2001), which includes a six-month scoping study period and an eight-month site visit and review process period for the full System Integration award.

### **System Integration Award**

- ♦ **Type of award anticipated:** Cooperative Agreement
- ♦ **Number of awards anticipated in FY 2001:** One
- ♦ **Amount of funds available:** Up to \$10,000,000 will be available for the System Integration award, pending availability of funds.
- ♦ **Anticipated date of award:** July 2001
- ♦ **Award duration:** July 2001 to September 30, 2004. The NEES System must be fully operational by September 30, 2004.

## **PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS**

- ♦ **Proposal Preparation Instructions**
  - **Letter of Intent requirements:** None
  - **Preproposal requirements:** None
  - **Proposal preparation instructions:** Standard NSF Grant Proposal Guide (GPG) (NSF 00-2) instructions.
  - **Supplemental proposal preparation instructions:** In addition to the instructions in the GPG, proposals must be prepared in accordance with the supplemental instructions in this solicitation.

- **Deviations from standard (GPG) proposal preparation instructions:** Page limit increased and one Appendix authorized.

♦ **Budgetary Information**

- **Cost sharing/matching requirements:** Not required and will not be a factor in the merit review process.
- **NSF will consider payment of reasonable fees to profit-making entities.**
- **Indirect cost (F&A) limitations:** None
- **Other budgetary limitations:** Scoping study awards (up to three) up to \$300,000 each, over a six-month award duration; System Integration award (one) up to \$10,000,000 total over the award duration.

♦ **FastLane Requirements**

- **FastLane proposal preparation requirements:** FastLane proposal submission required.
- **FastLane point of contact:** FastLane User Support, (703) 306-1142, fastlane@nsf.gov

♦ **Deadline/Target Dates**

- **Full proposal deadline:** FastLane Submission: 5:00 PM, submitter's local time, March 21, 2000; signed cover sheet and signed subaward budgets: by March 28, 2000.

Mail signed cover sheet and signed subaward budgets, as one complete package, to:

NSF 00-7, NEES Program  
ATTN: Dr. Joy Pauschke  
Division of Civil and Mechanical Systems  
Room 545  
National Science Foundation  
4201 Wilson Boulevard  
Arlington, VA 22230

## **PROPOSAL REVIEW INFORMATION**

- ♦ **Merit Review Criteria:** Standard National Science Board approved criteria and additional merit review criteria listed in this solicitation.

## AWARD ADMINISTRATION INFORMATION

- ♦ **Grant Award Conditions:** NSF will use a cooperative agreement as the award instrument. Award conditions are GC-1 and CA-1.
- ♦ **Special grant conditions anticipated:** Award conditions will reflect the type of awardee organization (profit vs. non-profit entities).
- ♦ **Special reporting requirements anticipated:** For the scoping study awards, the scoping study report must be submitted to NSF six months after the award date, with no time extensions allowed; due date of the final report will be specified in the cooperative agreement. For the System Integration award, reporting requirements will be specified in the cooperative agreement.

## INTRODUCTION

The Directorate for Engineering of the National Science Foundation (NSF) announces a program to establish the Network for Earthquake Engineering Simulation (NEES). The goal of the NEES Program is to provide a networked, national resource of geographically-distributed, shared-use next generation experimental research equipment installations, with teleobservation and teleoperation capabilities, which will shift the emphasis of earthquake engineering research *from* current reliance on physical testing *to* integrated experimentation, computation, theory, databases, and model-based simulation. NEES will be a collaboratory,<sup>1</sup> i.e., an integrated experimental, computational, communications, and curated repository system, developed to support collaboration in earthquake engineering research and education. The NEES collaboratory will network teleobservation and teleoperation capabilities of the NEES experimental research equipment and also give researchers remote access to a curated repository of databases, user-developed simulation software, and models for use in model-based simulation and visualization. Through NEES, the earthquake engineering community will be catalyzed to utilize its advanced experimental capabilities to test and validate more complex and comprehensive analytical and computer numerical models that will improve the seismic design and performance of our Nation's civil and mechanical systems. NSF plans that the NEES collaboratory will be developed by September 30, 2004, and will be operational through September 30, 2014.

The NEES Program will be developed through a series of NSF program solicitations that will establish NEES earthquake engineering research equipment sites, the NEES System, and the NEES Consortium. The "NEES: Earthquake Engineering Research Equipment" solicitations (NSF 00-6 for Phase 1 and an anticipated Phase 2 solicitation to be issued in

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<sup>1</sup> "National Collaboratories: Applying Information Technology for Scientific Research," Committee on a National Collaboratory, National Research Council, National Academy Press, Washington, D.C., 1993.

FY 2002) will establish 25-30 networked NEES host research equipment sites, with teleobservation and teleoperation capabilities, that include: 1) shake table research equipment, 2) centrifuge research equipment, 3) tsunami/wave tank research equipment, 4) large-scale laboratory experimentation systems, and 5) field experimentation and monitoring installations. Proposals for NEES research equipment may be submitted by U.S. universities and colleges. The NEES equipment may be housed at a host site that is either at the academic institution (i.e., host institution) or, for field experimentation and monitoring installations, remote from the academic institution. For additional information on the program solicitation for NEES earthquake engineering research equipment, see the companion solicitation, NSF 00-6, "NEES: Earthquake Engineering Research Equipment." When issued, NSF 00-6 can be found at: <<http://www.nsf.gov/cgi-bin/getpub?nsf006>>.

The companion solicitation, "NEES: Consortium Development," (NSF 01-56), will develop the entity that will provide the leadership, management, and coordination for the NEES collaboratory, when completed. For additional information on the NEES Consortium, see the companion solicitation, NSF 01-56, "NEES: Consortium Development." When issued, NSF 01-56 can be found at: <<http://www.nsf.gov/cgi-bin/getpub?nsf01-56>>.

This solicitation (NSF 00-7) requests proposals for one NEES System Integration award to develop the NEES System and implement the NEES collaboratory. NSF will use a two-step merit review process to select the one System Integration award. Proposals submitted to this solicitation will contain two proposals in the project description: the full system integration proposal and the scoping study proposal. First, as a precursor to the System Integration award, NSF intends to fund up to three awards for six-month scoping studies. Second, depending on the quality of the scoping study reports and the original proposals, NSF intends to select one System Integration award from among the scoping study awardees. The System Integration awardee will develop and operate the NEES System through September 30, 2004.

During FY 2001, NSF intends to make one NEES Consortium award, following a competitive merit review process and pending availability of funds. The NEES Consortium awardee will coordinate the interface of the NEES System Integration awardee with the earthquake engineering research community. NSF reserves the right to transfer the NEES System Integration award to the NEES Consortium to assume oversight responsibility before September 30, 2004, at such a date as the NEES Consortium is operational. By September 30, 2004, the System Integration awardee will assist in the transition of the NEES System and collaboratory to management by the NEES Consortium. *At the time of this transition, the System Integration awardee will turn over to NSF, the NEES Consortium, or an awardee to be designated by NSF: (1) all software and documents developed for the NEES System, including source codes and*



*copyright, and all software licenses purchased for the NEES System, and (2) all equipment acquired for the NEES System (e.g., networking equipment, servers, and workstations).*

The NSF NEES web site, at <<http://www.eng.nsf.gov/nees>>, contains links to selected earthquake engineering web sites and information about site visits conducted by NSF to support the preparation of the NSF NEES Program solicitations. Several workshops have been held that focused on various aspects leading to the development of the NEES Program. Proposers may want to consider the recommendations from these workshops in preparing their proposal for this solicitation. Publications available from these workshops are listed below and may be accessed through links provided at the NSF NEES web site.

“Assessment of Earthquake Engineering Research and Testing Capabilities in the United States,” Earthquake Engineering Research Institute, Proceedings: Document WP-01A, Summary Report: Document WP-01. September 1995.

“An Experimental Facilities Initiative in Earthquake Engineering: Action Plan for Upgrading, Expansion and Utilization,” Report to NSF, January 1996.

“Developing a National Network with Structural, Seismological, and Coastal Earthquake Engineering Seismic Simulation Facilities,” University of California at Davis, April 1999 (workshop date May 1998).

“Report for a National Science Foundation Workshop for Tsunami Research Facilities,” 1998, NSF Workshop Report.

NSF will maintain a listing of Frequently Asked Questions (FAQ) relating to this solicitation, and this FAQ page will be accessible through the NSF NEES web site.

## **PROGRAM DESCRIPTION**

### **A. The NEES System**

This purpose of this solicitation is to develop the high performance NEES System for the NEES collaboratory and implement the collaboratory. The NEES System must provide end-to-end connectivity supporting two interconnected subsystems: (1) an operating subsystem to connect distributed NEES experimental research equipment and provide a curated repository, and (2) a computational subsystem to enable computation and distributed simulation for earthquake engineering research. The operating subsystem must provide teleobservation and teleoperation participation in experiments using geographically distributed, shared-use NEES research equipment, with sharing of experimental data and video views in near-real-time. The computational subsystem must be linked to the operating subsystem to allow researchers to use external data to plan and

conduct experiments (e.g., to use actual or simulated seismic data as input to physical testing), analyze the results of experiments, conduct numerical simulations, and visualize data.

The System Integration awardee will design and implement the NEES System, including identifying, acquiring, and integrating the required system software and hardware. This includes identifying possible site-specific hardware and software requirements for the NEES equipment awards to meet the goal of the NEES Program for networking each NEES equipment site with the NEES collaboratory. The NEES System Integration awardee will work with NEES equipment awardees (NSF 00-6 and any subsequent NEES: Earthquake Engineering Research Equipment solicitation), under the coordination of the NEES Consortium, to finalize the networking concept for the collaboratory. The System Integration awardee may specify site-specific local networking equipment such as workstations dedicated to networking, specialized processors, NEES equipment interfaces, local area networking within the NEES equipment installation, the installation's interface with the host institution, and the host institution's high performance interface to the Internet. NSF intends to support such equipment for use specifically for the NEES Program at a later date as supplements to the NEES equipment awards.

The System Integration awardee must develop working prototypes of the two subsystems within two years of the System Integration award date, and to achieve a fully operational NEES System by September 30, 2004. The prototypes should include any NEES equipment sites that have become operational with sufficient lead-time to be incorporated into the prototypes. Acceptance tests are required for all operational components of the NEES System. This includes the connections to individual equipment sites to enable teleobservation and teleoperation, the two interconnected subsystems, connections to high performance networks and existing high performance computers and data stores, and all software.

The NEES System will give researchers remote access to a curated repository of databases, user-developed simulation software, and models for use in model-based simulation and visualization. The System Integration awardee will work extensively with the earthquake engineering research community, under the coordination of the NEES Consortium when established, to define procedures for collecting, processing, retrieving, and disseminating data sets and user-developed simulation software and will implement these procedures to produce the curated repository for the NEES System. The System Integration awardee will be responsible for curating and operating this repository through September 30, 2004.

The NEES System will form an integrated, networked collaboratory that facilitates collaboration among scientists and engineers, including educators, students, practitioners, and public sector organizations, both within the U.S. and abroad. There is expected to be continued growth in the size of the NEES user community and in the community's utilization of the NEES collaboratory. Users will continue to require new levels of connectivity and communications, mass storage, speed, system memory, and system integration services. The System Integration awardee will be expected to plan for and

monitor these changes in usage at each NEES equipment site and throughout the NEES System. The System Integration awardee will be expected to take appropriate action to include careful assessment of future needs in establishing the NEES System capacity and operating policies. To incorporate the experimental, collaborative, computational, modeling, and archival needs of the earthquake engineering research community, the System Integration awardee, under direction of the NEES Consortium when established, will be expected to interface extensively with this community through outreach and training activities to design, promote, and facilitate use of the NEES System through September 30, 2004. The System Integration awardee will also be required to monitor and assess the performance of the NEES System and its use through September 30, 2004.

Developing the NEES System includes establishing the configuration of the three main software layers: the programming interfaces for NEES equipment at the host equipment sites; the "middleware" needed to facilitate networked collaboration, including database query and retrieval interfaces; and an application development and operation environment, including a networked numerical simulation capability. Software, including embedded software and processors, for the NEES research equipment will have to be adapted to enable teleobservation and teleoperation participation during experimental testing. Proposers should address alternative strategies for modifying software for a variety of equipment systems and criteria for selecting the most cost-effective approach. Off-the-shelf software or widely available research-enabling systems must be used to the greatest extent possible. To the extent that off-the-shelf software does not meet the precise needs of the NEES System, software development (e.g., by customizing and combining off-the-shelf software) may be required to implement the two subsystems. The NEES System must be upgradable as required by demand, usage, and program goals. Proposed system designs must be flexible to adapt to and support both the changing external networking and data storage environments and the evolving requirements of the NEES collaboratory.

NSF offers the concept of a reference network to give proposers a basis for developing designs and cost estimates for the NEES System. The reference network is intended to achieve near-real-time dissemination of readouts ("teleobservation") from NEES research equipment by 2004. Proposers may suggest an alternative design. Proposers should, however, provide a rationale for their alternative as well as the design specifications and systems costs that would be associated with this alternative design. The reference network specification may be revised in light of the findings from the scoping studies.

The reference network is based on Gigabit Ethernet (1-10Gb/s) extending from the NEES equipment installation through to either the host institution's or the remote host site's Internet interface. The host institution's or host site's shared Internet access should be initially at least T3 (45Mb/s); or a private connection directly from the equipment installation to the Internet should be initially at least tens of Mb/s. Gigabit/second access to wide area networking should be achieved by 2004. This may be staged: the installation that contains the NEES equipment should be outfitted for Gigabit Ethernet

initially to provide growth potential, and the host institution's or host site's local area network could be upgraded later, if needed, or bypassed to provide a direct connection from the installation.

Internet access and ancillary equipment should be sized to provide a growth path for information transfer from the expected NEES equipment data instrumentation rates (likely to approach Gigabit/second in some instances) to anticipated Gigabit/second wide area networking by September 30, 2004. Academic institutions hosting NEES equipment sites or remote host sites must provide connectivity to high-performance networks such as vBNS (or its successor(s)) or Abilene. Initially, through September 30, 2003, over-provisioned networks, such as vBNS, vBNS+ and Abilene, and/or services similar to virtual private networking may be employed to ensure adequate service quality.

## **B. Design and Performance Criteria for the NEES System**

Design and performance criteria for various aspects of the NEES System are presented below. These criteria represent the minimum required capabilities for the NEES System and provide guidance to proposers in developing their designs and cost estimates. However, proposers are welcome to propose additional or alternative criteria that will result in a higher performance system.

### **1) Criteria for the NEES System**

- Must be fully operational by September 30, 2004.
- Must provide, through the system and subsystems, the high performance and collaborative environment required by the earthquake engineering user community. The design of the extended collaboratory environment within the NEES System must incorporate understanding of the sociology of the earthquake engineering community research culture.
- Must demonstrate working prototypes of the two subsystems within two years of the System Integration award date.
- Must have user interfaces that are simple and consistent for all network functions and data access.
- Must have modular subsystems that use off-the-shelf and widely available research-enabling software, where possible.
- Must use open standards, provide open interfaces, and allow for enhancement, upgrading, and migration to other platforms.
- Must be scalable to allow for substantial growth in the number and distribution of users and databases and in access to provide computational and modeling scalability.

- Must have subsystems extensible to new operations (e.g., new services and new NEES equipment sites).
- Must be configured with three main software layers: the programming interfaces for each NEES equipment site; the “middleware” needed to facilitate networked collaboration, including database query and retrieval interfaces; and an application development and operation environment, including a networked numerical simulation capability.
- Must use open, non-proprietary database solutions; must enable access via the web to summary data and complete data sets as well as for data maintenance (proposers are encouraged to consider "Internet developed" database solutions such as mysql, msql, postgresql, etc.).
- Must contain training and reference materials and easily accessible help services for systems operators and end-users.
- Must contain and use monitoring tools to evaluate the system performance and to determine the best configuration to achieve desired performance.
- Must provide a single security architecture allowing interoperability of individual site security mechanisms.

## 2) Criteria for the Operating Subsystem

- Must provide for remote participation in activities conducted at the NEES equipment sites (teleobservation at a minimum and teleoperation where appropriate and feasible), including experimental testing and video in near-real-time, with controlled access to prevent unauthorized use and conflicts among users.
- Must provide near-real-time visualization of data derived from experiments by researchers.
- Must provide real-time communication among a group of project-specific researchers for planning as well as during experimentation and quasi real-time exchange of experimental data, video, and text among a larger number of researchers.
- Must transmit experimental data to researchers in near-real-time (teleobservation). Must ensure that data transmission is reliable and consistent.
- Must provide a curated repository, a directory, and documentation standards for databases and user-developed software.
- Must collect and deposit data into a standardized set of curated dynamic distributed databases with provision for remote database management.

- Must provide a semantic interface that allows researchers to select earthquake characteristics and to define parameters for computational and physical experiments. Must support users searching the database using these parameters or their own semantics.
- Must support browsing, filtering, and sharing of knowledge related to experiments across the International Internet.
- Must provide a user-friendly interface to other earthquake and community-identified related databases on the Internet.

### 3) Criteria for the Computational Subsystem

- Must facilitate end-user selection and execution of user-developed software and must provide a user-friendly interface for this use.
- Must provide a user-friendly interface to the NEES curated database repository.
- Must provide a networked visualization environment for model output.
- Must provide programming interfaces to the operating subsystem through the databases so researchers can run numerical simulation models using NEES databases.
- Must provide connections to significant academic high performance computational facilities for large-scale modeling efforts.

## **ELIGIBILITY**

Proposals may be submitted by U. S. universities and colleges; U.S. non-profit, non-academic organizations in the U.S.; and U.S. for-profit organizations. Collaborative proposals involving more than one organization must be submitted as a single administrative package from the organization where the principal investigator is a full-time employee. The principal investigator must be a full-time employee of the organization submitting the proposal. The principal investigator and co-principal investigator(s) may not be principal investigator or co-principal investigator for proposals submitted to the companion solicitation, NSF 00-6, “NEES: Earthquake Engineering Research Equipment.” NSF expects continuity in key personnel from the scoping study award to the full system integration award, in the event that a System Integration award is made.

## **AWARD INFORMATION**

NSF will use a two-step merit review process leading to one award for NEES System Integration: (1) up to three scoping study awards, up to \$300,000 each, for a six-month duration and (2) one System Integration award, to be selected from among one of the scoping study awardees, up to \$10,000,000, from July 2001 to September 30, 2004. The scoping study and System Integration awards will be cooperative agreements. Proposals submitted to this solicitation will therefore contain two proposals in the project description: the full system integration proposal and the scoping study proposal. Proposals may be submitted for a total funding level of up to \$10,300,000, of which up to \$300,000 is to be budgeted for the scoping study proposal and up to \$10,000,000 is to be budgeted for the full system integration proposal.

As the first step, NSF expects to fund up to three awards, of up to \$300,000 each, for the conduct of the NEES System scoping study. The number of scoping study awards is subject to the quality of the proposals and the availability of funds. The scoping study awardees will conduct a six-month scoping study for the NEES System and produce a report to the NSF. At the time that the scoping study awards are made, NSF will specify the format for the scoping study report. NSF also intends to help facilitate joint interactions between all scoping study awardees and the earthquake engineering research community. The scoping study will focus on seven major issues: (1) user requirements; (2) the functions and performance of the system, subsystems, and their architecture; (3) the end-to-end network that supports the NEES collaboratory; (4) design and operation of the curated repository; (5) a distributed numerical simulation capability for NEES; (6) the software development process and the system to be used to develop software for the NEES System; and (7) collaborative capabilities, including teleobservation and teleoperation. As part of the scoping study, the awardees must assess needs of the collaborative environment, network readiness, and the characteristics of existing user-developed software. They will recommend possible methods to adapt NEES research equipment software to permit teleobservation and teleoperation participation in experimental testing in the collaboratory for the five equipment categories specified in the companion program solicitation, NSF 00-6, "NEES: Earthquake Engineering Research Equipment." The awardees will also define initial performance specifications for the NEES System. Scoping study reports will be due six months after the award date, with no time extensions allowed. After submission of the scoping study reports, merit reviews of the scoping study reports, which will include site visits, will be conducted for each scoping study award by a panel of experts. Anticipated date of scoping study awards: June 2000. The duration of the scoping study awards will be fourteen months, with a six-month scoping study period and an eight-month site visit and review process period for the full System Integration award.

As the second step, based on the merit reviews of scoping study reports and the original proposals, NSF intends to fund one System Integration award for up to \$10,000,000, pending availability of funds, with the System Integration award selected from among one of the scoping study awardees. NSF will consider the findings of the scoping study reports to establish the final specifications for the NEES System that will be incorporated

into the System Integration cooperative agreement award. Performance reporting and acceptance tests will be based on these specifications. Anticipated date of System Integration award: July 2001.

## **PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS**

### **A. Proposal Preparation Instructions**

Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *Grant Proposal Guide (GPG)*, NSF 00-2, and the supplemental proposal preparation instructions provided below. The complete text of the GPG (including electronic forms) is available electronically on the NSF Web site at: <<http://www.nsf.gov>>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone 301.947.2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

Proposers are reminded to identify the program solicitation number (NSF 00-7) in the program announcement/solicitation block on the NSF Form 1207, *Cover Sheet for Proposal to the National Science Foundation*. Compliance with this requirement is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

Proposals submitted to this solicitation must contain two proposals in the project description: the full system integration proposal and the scoping study proposal. The overall proposal should be assembled in the order shown below:

- **Information about Principal Investigators/Project Directors and co-Principal Investigators/co-Project Directors (NSF Form 1225).**
- **List of Suggested Reviewers or Reviewers Not to Include (optional).**
- **Cover Sheet for Proposal to the National Science Foundation (NSF Form 1207).**
- **Project Summary (GPG, NSF 00-2, Section II.D.2).**
- **Table of Contents (GPG, NSF 00-2, Section II.D.3).**
- **Project Description (GPG, NSF 00-2, Section II.D.4).** This section must contain the following three items: (1) the List of All Project Participants, (2) the Full System Integration Proposal (40-page maximum), and (3) the Scoping Study Proposal (10-page maximum). [Note: Due to current FastLane capabilities, the Appendix described below will need to be submitted in FastLane as a part of the Project Description file; the Appendix is not included in the page limits below.]



1. **List of All Project Participants.** This list must be grouped by organizations (academic, business/industrial, government, and others), beginning with the submitting organization and including all partners, subawardees, and consultants. For each organization, list all project participants, including names, professional titles, departments, organizational affiliations, and mailing addresses. (This list is not included in the page limits below.)
2. **Full System Integration Proposal (40-page maximum)** that presents the full proposal for NEES: System Integration. This includes the scope of work from July 2001 to September 30, 2004, for a budget of up to \$10,000,000. This section must follow the sequence below:
  - a) Results from prior NSF support.
  - b) Description of the overall concept for the NEES System and collaboratory.
  - c) NEES System configuration, design, and performance specifications, including how the NEES System and subsystems will meet the design and performance criteria listed in this solicitation, as well as any additional or alternative criteria suggested by the proposer.
  - d) Plans for working with high performance networks and the NEES earthquake engineering research equipment sites.
  - e) Plan for identifying, acquiring, and integrating the NEES System software and hardware and the software development process (e.g., by customizing and combining off-the-shelf software). Discuss alternative strategies for modifying software for NEES research equipment to permit teleobservation and teleoperation.
  - f) Plans for establishing protocols and standards for: hardware; data collection, processing, storage, dissemination, and retrieving; software; and creation and operation of the curated repository.
  - g) Management plan, including identification and management of any associated risks. Include a schedule and Gantt chart, which shows major milestones and deliverables, for the design, development, implementation, testing, and operation of the NEES System and the curated repository.
  - h) An annual plan for evaluating the effectiveness of NEES System Integration activities with and service to the earthquake engineering research community.
  - i) Anticipated issues to be addressed for transition of operation to the NEES Consortium before September 30, 2004.
  - j) Description of the proposing organization's previous experience in developing

similar high performance systems, curated repositories, and collaboratories for academic research environments and experimental equipment within the last five years, and client contacts (contact name, organization, phone number, and email address) for each project.

- k) Key personnel and other staff qualifications, including experience on similar projects and availability for this project, for both the scoping study and the full system integration proposed scopes of work.
  - l) Any additional proposer-identified items.
3. **Scoping Study Proposal (10-page maximum)** for a six-month investigation to establish more detailed design of the NEES System. This includes a scope of work for a six-month duration from June 2000 to December 2000 and a budget of up to \$300,000. This ten-page scoping study proposal is in addition to the full system integration proposal in item (2) above. This section must follow the sequence below:
- a) Goals and anticipated deliverables of the scoping study.
  - b) Management plan to conduct the scoping study, including schedule, milestones, key personnel, and other staff.
  - c) Detailed discussion of how the scoping study will define and assess: (1) user requirements; (2) the functions and performance of the system, subsystems, and their architecture; (3) the end-to-end network that supports the NEES collaboratory; (4) design and operation of the curated repository; (5) a distributed numerical simulation capability for NEES; (6) the software development process and the system to be used to develop software for the NEES System, bearing in mind that maximum use must be made of off-the-shelf software; and (7) collaborative capabilities, including teleobservation and teleoperation.
  - d) Any additional proposer-identified items.
- **References Cited (GPG, Section II.D.5).**
  - **Biographical Sketches (GPG, Section II.D.6).** For each key personnel, limited to two pages each.
  - **Budget (GPG, Section II.D.7, NSF Form 1030).** Provide annual budgets and a cumulative budget for each year of the project on NSF Form 1030, including all subaward budgets. The budget justification, which must not exceed three pages, should itemize and explain all project costs. The first year budget is the six-month scoping study budget, up to a total budget of \$300,000, starting in June 2000. The budget for the conduct of the full system integration proposal activities, up to a total

budget of \$10,000,000, should assume a start date of July 2001 and a completion date of September 30, 2004. Travel by the principal investigator to two NSF NEES Program meetings per year through September 30, 2004, plus two NSF NEES Program meetings during the duration of the scoping study award, should be included in the NSF budget request.

- **Current and Pending Support (GPG, Section II.D.8, NSF Form 1239).**
- **Facilities, Equipment, and Other Resources (GPG, Section II.D.9, NSF Form 1363).**
- **Appendix (GPG, Section II.D.11).** Only one appendix is authorized: An appendix containing letters of commitment from all project participant organizations, including subawardees and consultants. Copies of the letters should be scanned into the back section of the .PDF file containing the project description and submitted with the proposal on FastLane.

## **B. Budgetary Information**

**Cost sharing requirements:** None

## **C. Proposal Due Dates**

Proposals must be submitted by FastLane and electronic submission of the proposal must be completed by 5:00 PM, submitter's local time, March 21, 2000. The signed proposal cover sheet and signed subaward budgets must be submitted in accordance with the instructions identified below.

*Submission of Signed Cover Sheet and Signed Subaward Budgets.* The signed cover sheet (NSF Form 1207) and signed subaward budgets should be forwarded, collated as one complete package from the submitting organization, to the following address and received at NSF by March 28, 2000:

NSF 00-7, NEES Program  
ATTN: Dr. Joy Pauschke  
Division of Civil and Mechanical Systems  
Room 545  
National Science Foundation  
4201 Wilson Boulevard  
Arlington, VA 22230

NSF will not be responsible for collating separate mailings of signed cover sheets and signed subaward budgets. A proposal may not be processed until the complete proposal (including signed cover sheet and signed subaward budgets) has been received by NSF.

## **D. FastLane Requirements**

Proposers are required submit proposals using the NSF FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at <<https://www.fastlane.nsf.gov/a1/newstan.htm>>.

*Submission of Signed Cover Sheets and Signed Subaward Budgets.* The signed paper copy of the proposal Cover Sheet (NSF Form 1207) and signed subaward budgets should be forwarded to NSF within five working days, collated as one complete package from the submitting organization, following proposal submission in accordance with FastLane proposal preparation and submission instructions referenced above.

## **PROPOSAL REVIEW INFORMATION**

### **A. Merit Review Criteria**

Reviews of proposals submitted to NSF are solicited from peers with expertise in the substantive area of the proposed research or education project. These reviewers are selected by Program Officers charged with the oversight of the review process. NSF invites the proposer to suggest, at the time of submission, the names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from non-academic institutions, minority serving institutions or adjacent disciplines to that principally addressed in the proposal.

The full system integration and scoping study proposals and the scoping study reports will be reviewed against the following general merit review criteria established by the National Science Board. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgments.

#### **What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

#### **What are the broader impacts of the proposed activity?**

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the

participation of underrepresented groups (e.g., gender, ethnicity, disability, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities, instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

PIs should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give these factors careful consideration in making funding decisions.

### **Integration of Research and Education**

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learner perspectives.

### **Integrating Diversity into NSF Programs, Projects, and Activities**

Broadening opportunities and enabling the participation of all citizens -- women and men, underrepresented minorities, and persons with disabilities -- are essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

In addition to the general merit review criteria above, the following merit review criteria will be considered in reviewing the full system integration and scoping study proposals submitted in response to this program solicitation and the scoping study reports submitted by the scoping study awardees.

### **Additional Merit Review Criteria for the Full System Integration Proposal (40-page proposal)**

- Capabilities of proposing organization and team, including previous experience in developing similar high performance systems, curated repositories, and collaboratories for academic research environments and experimental equipment.
- Comprehensiveness of the concept for the overall NEES System and collaboratory.
- Quality of the proposed NEES System and subsystems, including the degree to which the proposed system and subsystems meet the design and performance criteria for the NEES System listed in the “Program Description” section of this solicitation and any additional or alternative proposed criteria.

- Likelihood that the proposing team will develop working prototypes of the two subsystems within two years of the award date and achieve a fully operational NEES System by September 30, 2004.
- Quality of plans for working with high performance networks and the NEES equipment awardees.
- Quality of plans for establishing protocols and standards for: hardware; data collection, processing, storage, dissemination, and retrieving; software; and creation and operation of the curated repository.
- Demonstrated knowledge of appropriate software for the NEES subsystems, with emphasis on commercially available, supported software and modular design employing open standard interfaces.
- Completeness and reliability of the software development process and the procedure for ensuring software quality.
- Quality of proposed procedures to support cooperative relationships with hardware and software vendors and high performance network providers.
- Quality of the proposed management plan, including schedule, milestones, and management of associated risks.
- Quality of proposed plan for evaluating the effectiveness of NEES System Integration activities with and service to the earthquake engineering research community.
- Likelihood of ease of transition of operation of the NEES System from the NEES System Integration awardee to the NEES Consortium.
- Is the budget realistic and appropriately justified?

**Additional Merit Review Criteria for the Scoping Study Proposal (10-page proposal)**

- Quality of the management plan to conduct the scoping study, including key personnel qualifications.
- Quality of the plans to define and assess: (1) user requirements; (2) functions and performance of the system, subsystems, and their architecture; (3) the end-to-end network that supports the NEES collaboratory; (4) design and operation of the curated repository; (5) a distributed numerical simulation capability for NEES; (6) the software development process and the system to be used to develop software for the NEES System; and (7) collaborative capabilities, including teleobservation and teleoperation.

- Is the budget realistic and appropriately justified?

**Additional Merit Review Criteria for the Scoping Study Reports (For Scoping Study Awards Only)**

- Degree to which the scoping study has defined and assessed: (1) user requirements; (2) comprehensive and complete specifications for the functions and performance of the system, subsystems, and their architecture; (3) the end-to-end network that supports the NEES collaboratory; (4) design and operation of the curated repository; (5) the distributed numerical simulation capability for NEES; (6) the software development process and the system to be used to develop software for the NEES System; and (7) collaborative capabilities, including teleobservation and teleoperation.
- Quality of the proposed NEES System and subsystems, refined as a result of the scoping study. Quality to be assessed in terms of the design and performance criteria for the NEES System listed in this solicitation and any additional or alternative criteria suggested by the proposer in the original full system integration proposal and the scoping study report.
- Appropriate assessment of the risks and overall likelihood that the proposing team will develop working prototypes of the two subsystems, refined as a result of the scoping study, within two years of the award date and achieve a fully operational NEES System by September 30, 2004.
- Expected responsiveness and effectiveness of the proposing team in interfacing with the NEES equipment awardees and the earthquake engineering research community.
- Ability of the proposing team to address reviewer issues raised in the review of the original proposal submission.

**B. Review Protocol and Associated Customer Service Standard**

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Proposals submitted in response to this solicitation will be reviewed by a combination of individual reviews, panel reviews, and site visits by experts from the earthquake engineering research community, the networking and software industry, and other appropriate fields. The proposal submission, which includes a full system integration proposal and a scoping study proposal, will be reviewed by a panel of experts and, as needed, ad hoc mail reviews. Site visits will be conducted for each scoping study award, which will include a merit review of the scoping study report, within two months after submission of the scoping study report. After all site visits are completed, a final panel will be convened to recommend one System Integration award.

Reviewers will be asked to formulate a recommendation to support or decline each proposal. A program officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation. In most cases, proposers will be contacted by the program officer after his or her recommendation to award or decline funding has been approved by his or her supervisor, the division director. This informal notification of an award is not a guarantee of an eventual award. NSF will be able to tell applicants whether their proposals have been declined or recommended for funding within six months for 95 percent of proposals in this category. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. The interval ends when the division director accepts the program officer's recommendation.

In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A principal investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants Officer does so at its own risk.

## **AWARD ADMINISTRATION INFORMATION**

### **A. Notification of the Award**

Notification of the award is made *to the submitting organization* by a Grants Officer in the Division of Grants and Agreements (DGA). Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Division administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator.

### **B. Grant Award Conditions**

An NSF grant consists of: (1) the award letter, which includes any special provisions applicable to the grant and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award letter; (4) the applicable grant conditions, such as Grant General Conditions (NSF GC-1)\* or Federal Demonstration Partnership Phase III (FDP III) Terms and Conditions;\* and (5) any NSF brochure, program guide, announcement, or other NSF issuance that may be incorporated by reference in the award letter. NSF will use cooperative agreements as the funding agreements for the scoping study and System Integration awards. Cooperative agreements awards are also administered in accordance with the NSF Cooperative



Agreement Terms and Conditions (CA-1).<sup>\*</sup> Electronic mail notification is the preferred way to transmit NSF grants to organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

<sup>\*</sup>These documents may be accessed electronically on NSF's Web site at: <<http://www.nsf.gov>>. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone 301.947.2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, (NSF 95-26), available electronically on the NSF Web site. The GPM also is available in paper copy by subscription from the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The GPM may be ordered through the GPO Web site at: <<http://www.gpo.gov>>. The telephone number at GPO for subscription information is 202.512.1800.

### **C. Reporting Requirements**

For the scoping study awards, the scoping study report must be submitted to NSF six months after the award date, with no time extensions allowed. The due date of the final report will be specified in the cooperative agreement.

For all multi-year grants (including both standard and continuing grants), including the System Integration award, the PI must submit an annual project report to the cognizant Program Officer at least 90 days before the end of the current budget period. The cooperative agreement will include specific annual report due dates that will be at least 90 days before the end of the current budget period and due dates for any additional interim reporting requirements.

For the System Integration award, within 90 days after expiration of the award, the PI also is required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file the final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the formats of the required reports in advance to assure availability of required data.

NSF has implemented a new electronic project reporting system, available through FastLane, which permits electronic submission and updating of project reports, including information on: project participants (individual and organizational); activities and findings; publications; and, other specific products and contributions. Reports will continue to be required annually and after the expiration of the grant, but PIs will not need to re-enter information previously provided, either with the proposal or in earlier updates using the electronic system.

Effective October 1, 1999, PIs are required to use the new reporting system for submission of annual and final project reports.

#### **D. New Awardee Information**

If the submitting organization has never received an NSF award, it is recommended that the organization's appropriate administrative officials become familiar with the policies and procedures in the NSF *Grant Policy Manual* which are applicable to most NSF awards. The "Prospective New Awardee Guide" (NSF 99-78) includes information on Administration and Management Information; Accounting System Requirements and Auditing Information; and Payments to Organizations with NSF Awards. This information will assist an organization in preparing documents that NSF requires to conduct administrative and financial reviews of an organization. The guide also serves as a means of highlighting the accountability requirements associated with Federal awards. This document is available electronically on NSF's Web site at: <<http://www.nsf.gov/cgi-bin/getpub?nsf9978>>.

#### **E. Award Oversight**

NSF will conduct merit reviews of the progress and plans of the System Integration awardee through annual site visits, with the site visit team consisting of experts from the earthquake engineering community, the networking and software industry, and other appropriate fields. NSF will maintain close contact with the System Integration awardee throughout the duration of the cooperative agreement. The System Integration awardee should consult with NSF on all major decisions concerning the NEES System. Under the direction of the NEES Consortium, the NEES System Integration awardee will work closely with the earthquake engineering research community. As NSF awards NEES equipment sites, the System Integration awardee should plan to work with these awardees to define site-specific local networking equipment.

#### **F. NEES Data Policy**

As a general policy, NSF will require submission of NEES-related NSF-supported data, derived data products, samples, physical collections, and other supported materials to the NEES collaboratory research data centers and other specified repositories. NSF expects investigators to share data and information on experiments with other researchers at no more than incremental cost and within a reasonable time. Investigators should be prepared to work with the NEES System Integration awardee to establish standards and to require application of such standards for collection, processing, and communication of NSF-sponsored data sets.

### **CONTACTS FOR ADDITIONAL INFORMATION**

To ensure that all proposers receive the same information, all questions concerning this solicitation, except for those related to FastLane, will only be accepted by e-mail. Please e-mail questions to [nees@nsf.gov](mailto:nees@nsf.gov) and include in the heading "SYSTEM INTEGRATION SOLICITATION." All questions, except for those related to FastLane, must be received at NSF on or before February 11, 2000, so that NSF can post the responses of interest to

all proposers before the proposal deadline on the NSF NEES FAQ web page at: <<http://www.eng.nsf.gov/nees>>. For questions related to use of FastLane, contact FastLane User Support, (703) 306-1142, [fastlane@nsf.gov](mailto:fastlane@nsf.gov).

Within the Directorate for Engineering, the Division of Civil and Mechanical Systems will administer the NEES Program. The NSF NEES Program Team is as follows:

Dr. Joy Pauschke, NEES Program Director, Directorate for Engineering, telephone (703) 306-1380, e-mail: [nees@nsf.gov](mailto:nees@nsf.gov).

Dr. Steven N. Goldstein, Senior Advisor for Information Technology, Directorate for Engineering, telephone (703) 306-1349, e-mail: [nees@nsf.gov](mailto:nees@nsf.gov).

Dr. Priscilla P. Nelson, Director, Division of Civil and Mechanical Systems, telephone (703) 306-1361, e-mail: [nees@nsf.gov](mailto:nees@nsf.gov).

## **OTHER PROGRAMS OF INTEREST**

The NSF Guide to Programs is a compilation of funding for research and education in science, mathematics, and engineering. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter. Many NSF programs offer announcements concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices listed in Appendix A of the GPG. Any changes in NSF's fiscal year programs occurring after press time for the Guide to Programs will be announced in the NSF Bulletin, available monthly (except July and August), and in individual program announcements. The Bulletin is available electronically via the NSF Web Site at: <<http://www.nsf.gov>>. The direct URL for recent issues of the Bulletin is <<http://www.nsf.gov/od/lpa/news/publicat/bulletin/bulletin.htm>>. Subscribers can also sign up for NSF's Custom News Service to find out what funding opportunities are available.

## **ABOUT THE NATIONAL SCIENCE FOUNDATION**

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Grantees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers and educators. The Foundation strongly encourages women, minorities, and persons with disabilities to compete fully in its programs. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subjected to

discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program announcement or contact the program coordinator at (703) 306-1636.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation regarding NSF programs, employment, or general information. TDD may be accessed at (703) 306-0090 or through FIRS on 1-800-877-8339.

We want all of our communications to be clear and understandable. If you have suggestions on how we can improve this document or other NSF publications, please email us at [plainlanguage@nsf.gov](mailto:plainlanguage@nsf.gov).

## **PRIVACY ACT AND PUBLIC BURDEN STATEMENTS**

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

Public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information,

including suggestions for reducing this burden, to: Reports Clearance Officer; Information Dissemination Branch, DAS; National Science Foundation; Arlington, VA 22230.

### **YEAR 2000 REMINDER**

In accordance with Important Notice No. 120 dated June 27, 1997, Subject: Year 2000 Computer Problem, NSF awardees are reminded of their responsibility to take appropriate actions to ensure that the NSF activity being supported is not adversely affected by the Year 2000 problem. Potentially affected items include: computer systems, databases, and equipment. The National Science Foundation should be notified if an awardee concludes that the Year 2000 will have a significant impact on its ability to carry out a NSF funded activity. Information concerning Year 2000 activities can be found on the NSF web site at <http://www.nsf.gov/oirm/y2k/start.htm>.

**Catalogue of Federal Domestic Assistance (CFDA) No.:** 47.041 – Engineering Grants

**OMB No.:** 3145-0058

NSF 00-7